Tuesday, 28 August 2001

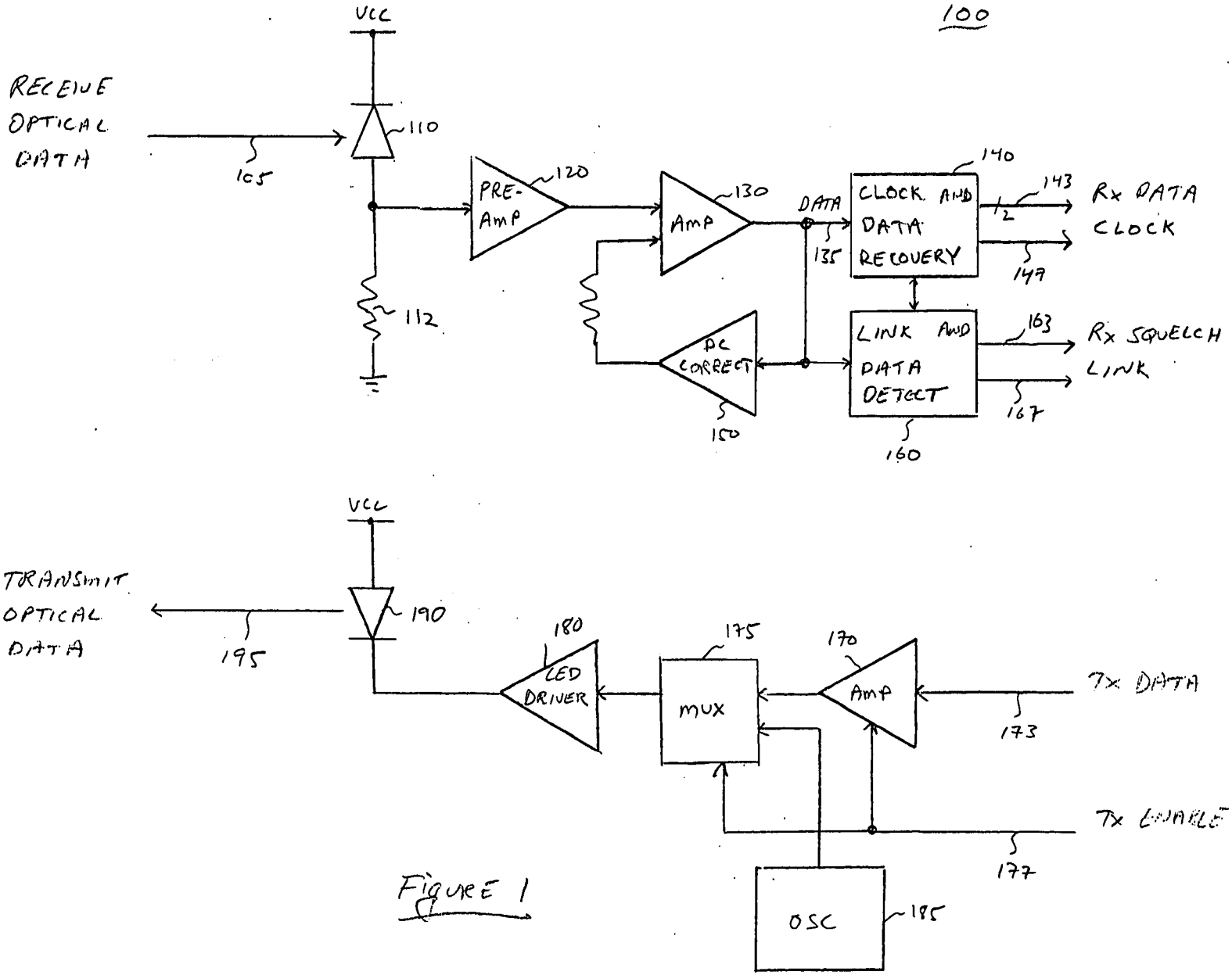


Figure 1

TO2T20'68986260

200

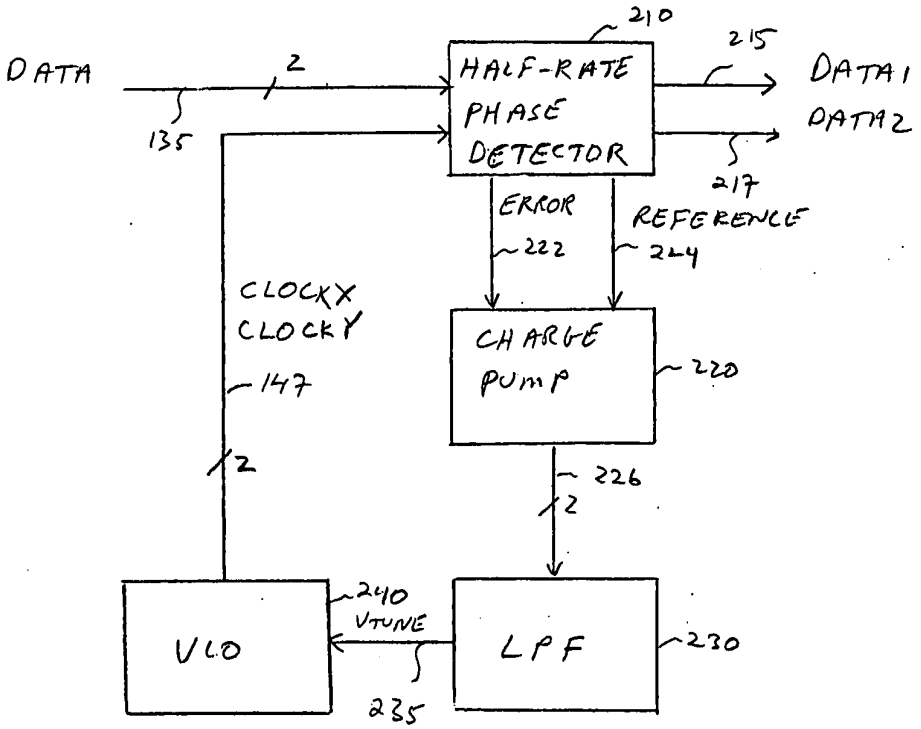
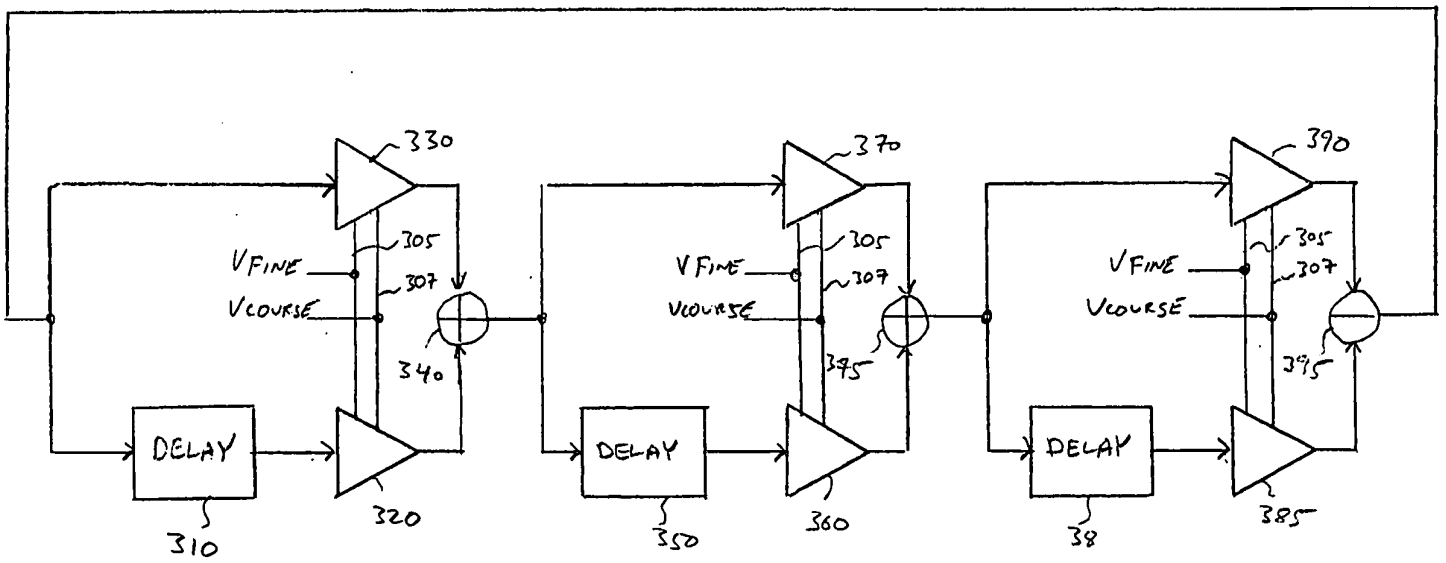


Figure 2

TOATED 26926260



300

Figure 3

TOETZO" 6896260

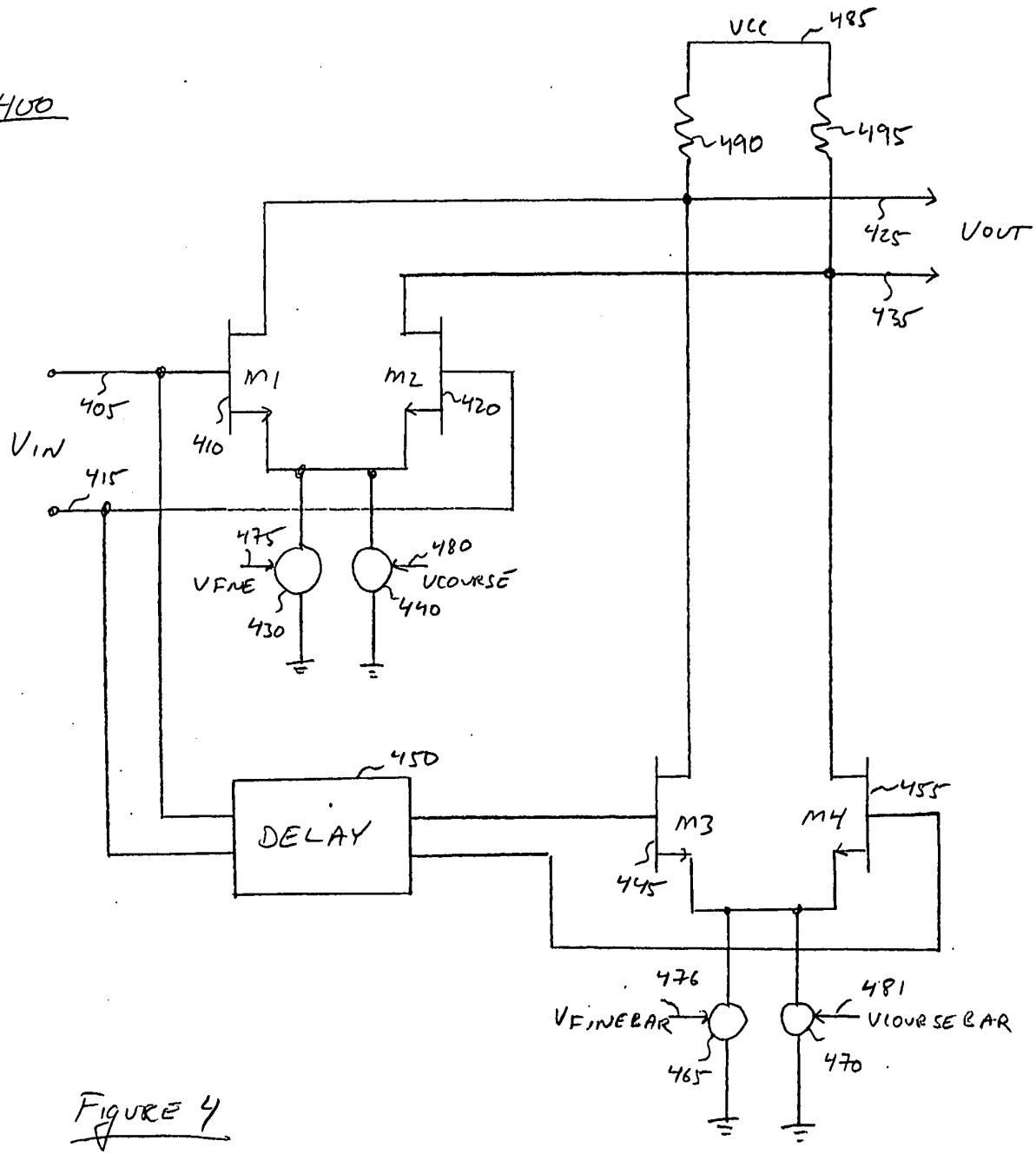


Figure 4

T02T20 "28928660

500

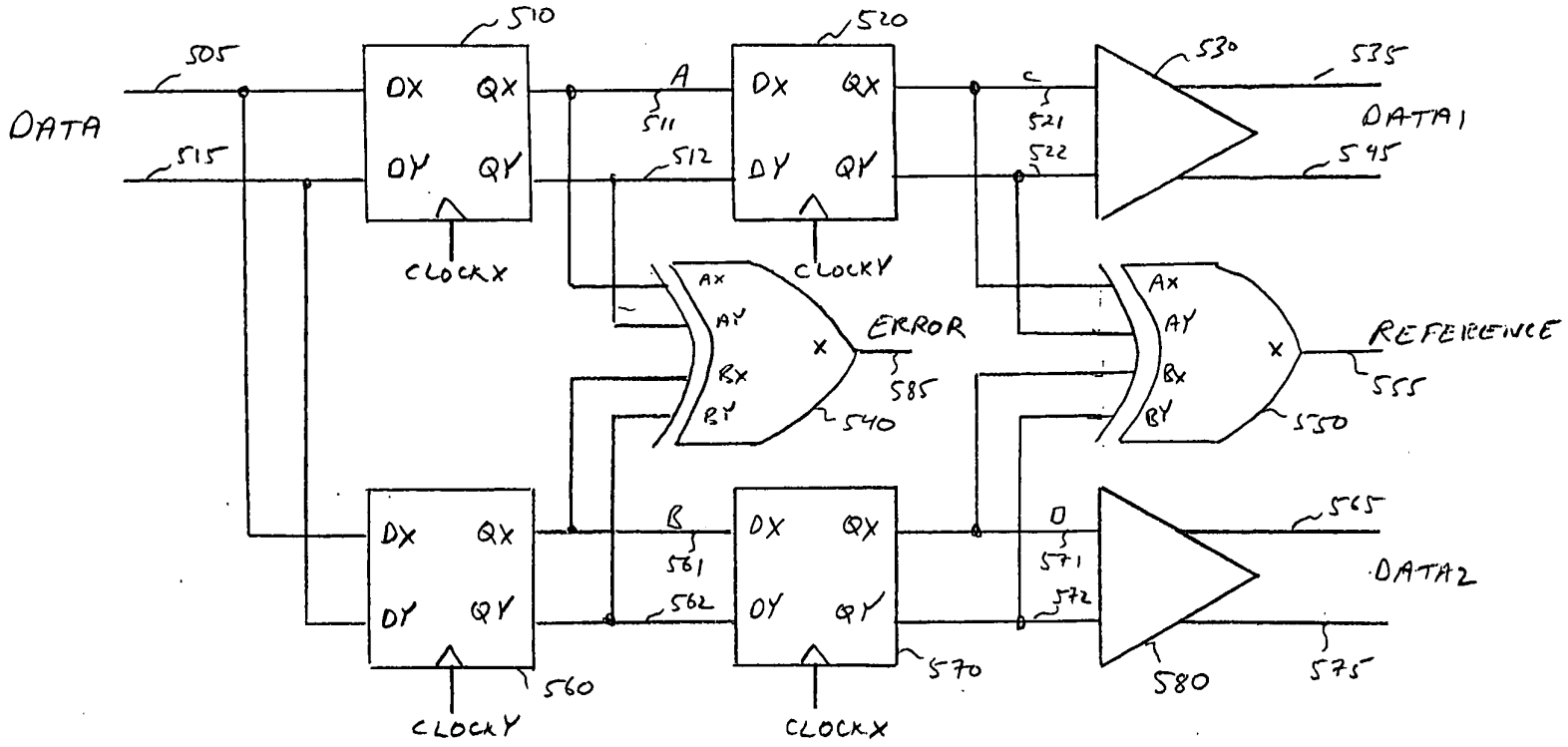


Figure 5

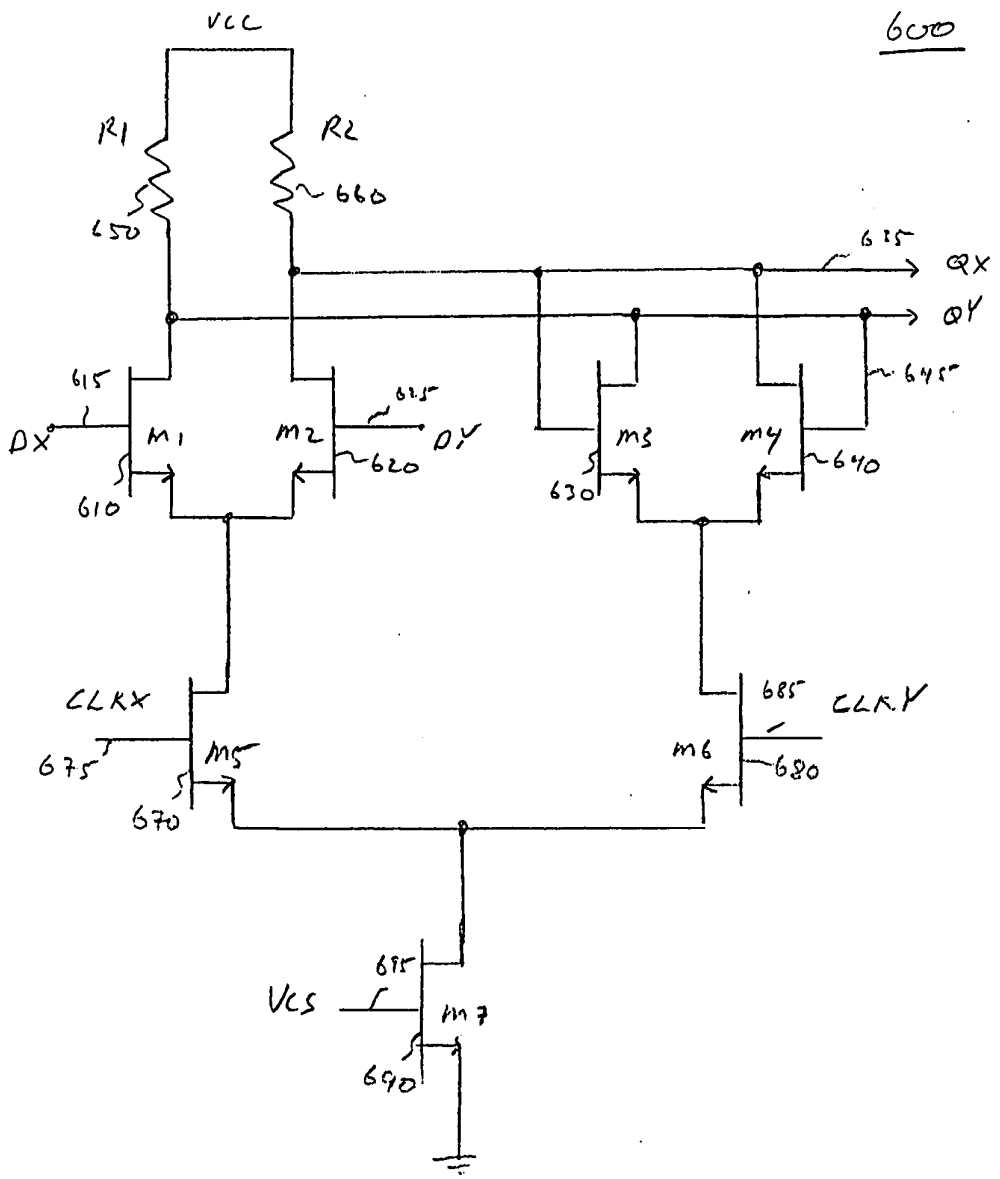

600
VCC
R1
R2
650
660
635
QX
QY
645
615
625
DX
M1
M2
DY
620
610
M3
M4
640
630
CLKX
675
M5
670
685
CLKY
M6
680
695
VCS
M7
690

Figure 6

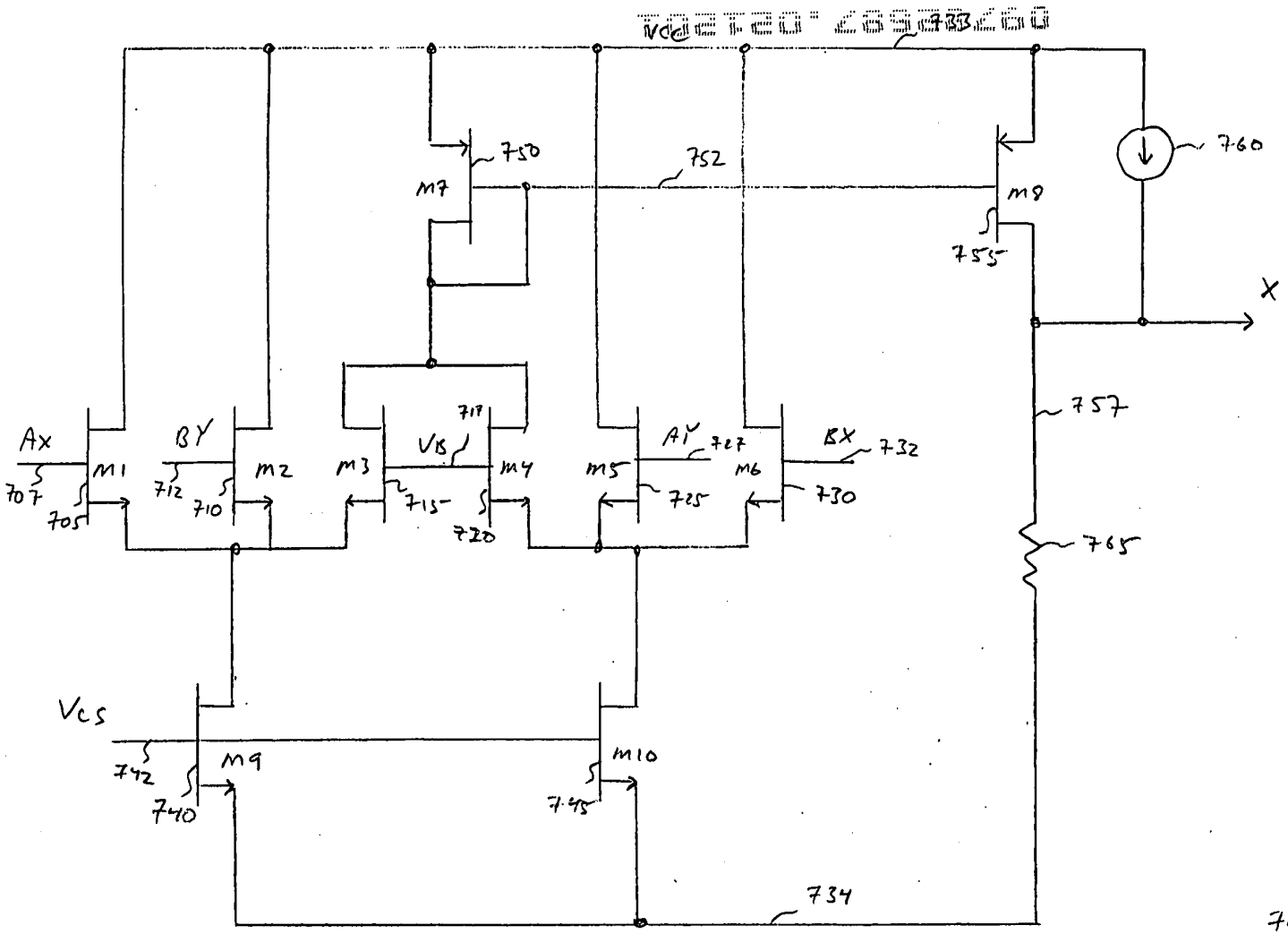


FIGURE 7B

FIGURE 7A

A	B	A⊕B	$\overline{A}$	$\overline{A}+B$	$\overline{B}$	$A+\overline{B}$	$(\overline{A}+B)+(A+\overline{B})$
0	0	0	1	0	1	0	0
0	1	1	1	0	0	1	1
1	0	1	0	1	1	0	1
1	1	0	0	0	0	0	0

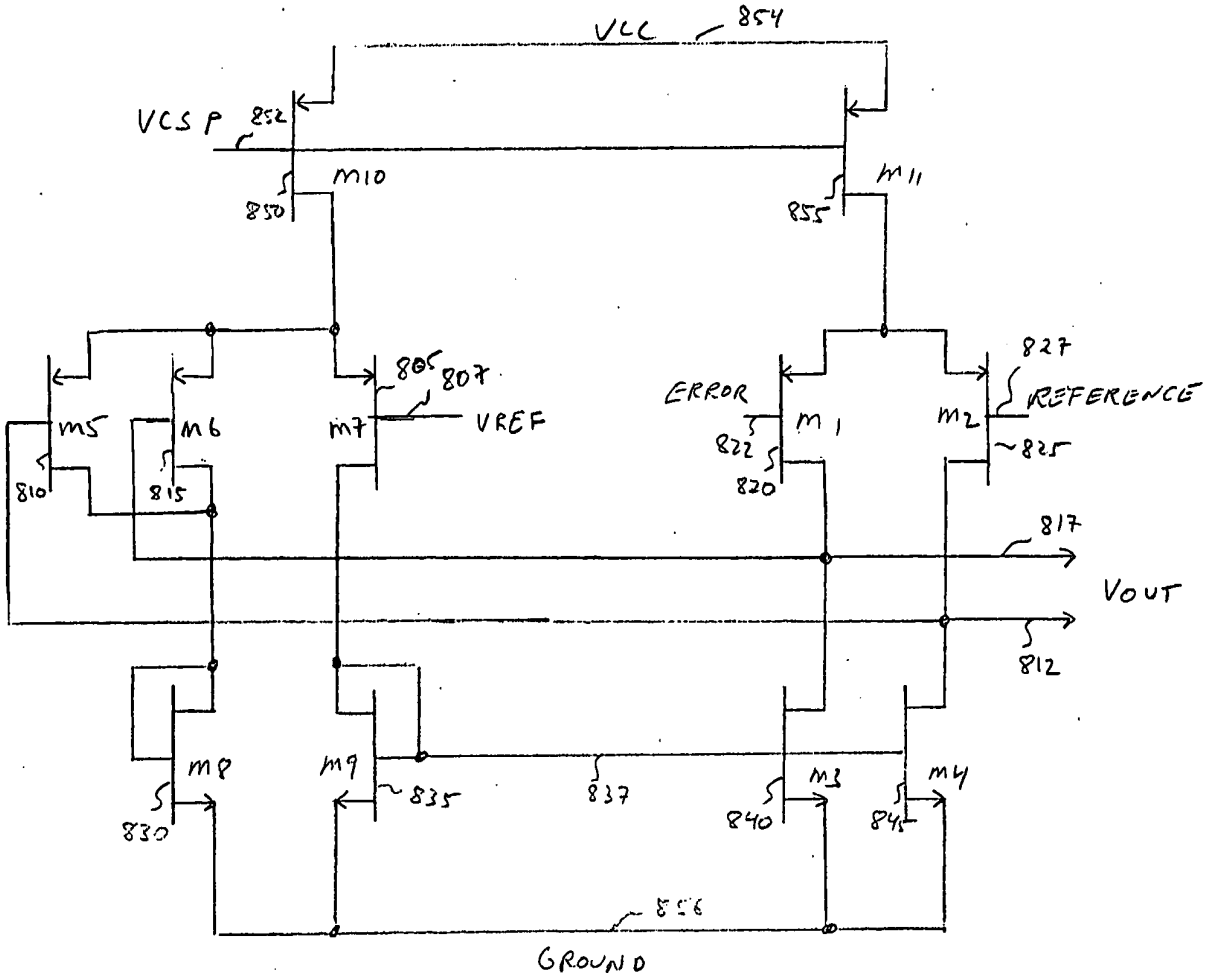

VCC
854
VCSP
852
800
M10
850
M11
855
827
805
807
ERROR
REFERENCE
M5
M6
M7
VREF
M1
M2
822
820
825
810
815
817
VOUT
812
M8
M9
835
837
M3
M4
830
840
845
856
GROUND

FIGURE 8

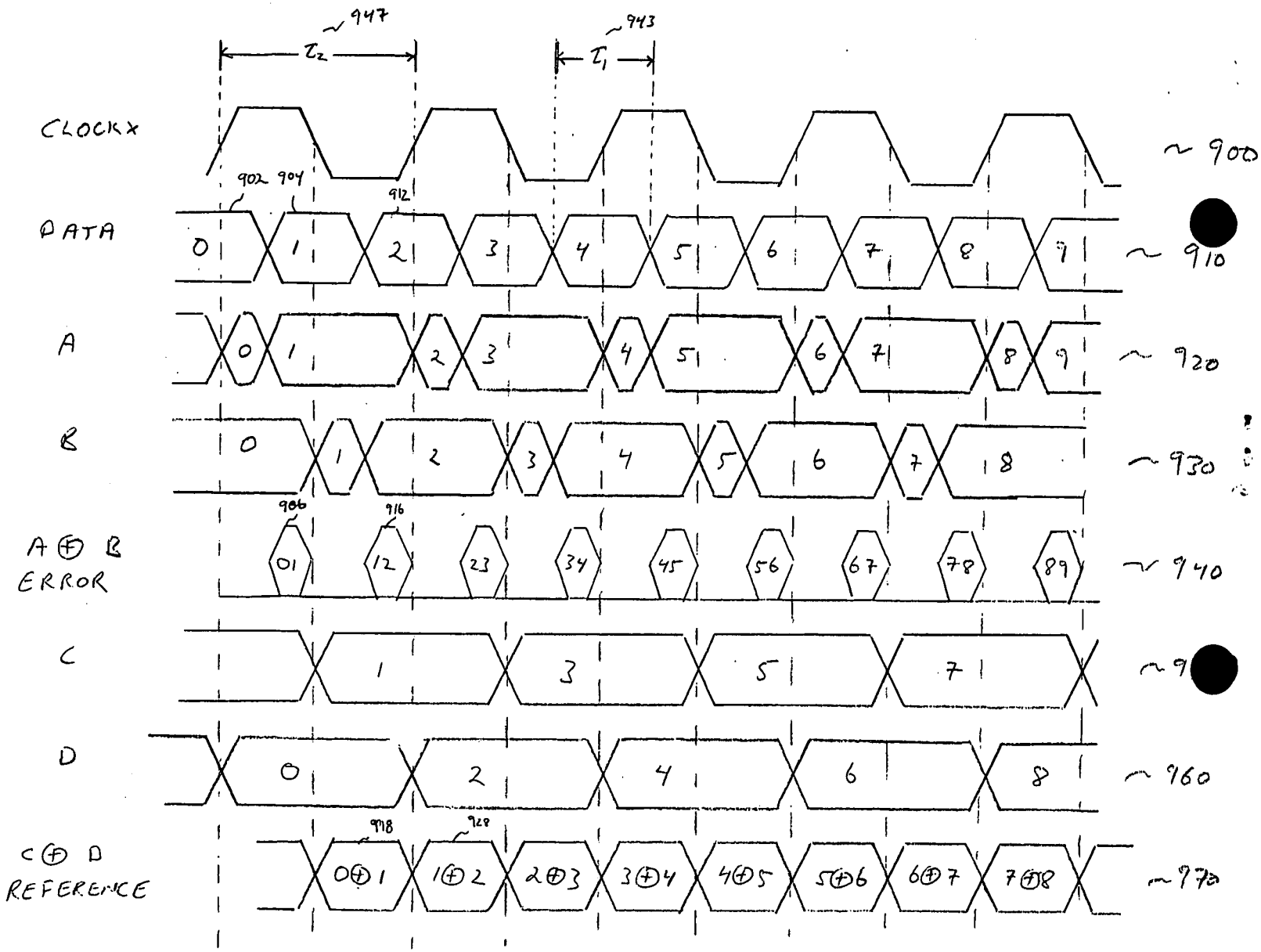

947
T_2
943
T_1
CLOCKx
900
902
904
912
DATA
0 1 2 3 4 5 6 7 8 9
910
A
0 1 2 3 4 5 6 7 8 9
920
B
0 1 2 3 4 5 6 7 8
930
906
916
A ⊕ B ERROR
01 12 23 34 45 56 67 78 89
940
C
1 3 5 7
9
D
0 2 4 6 8
960
918
928
C ⊕ D REFERENCE
0⊕1 1⊕2 2⊕3 3⊕4 4⊕5 5⊕6 6⊕7 7⊕8
970

Figure 9

TO2T20 "28928260

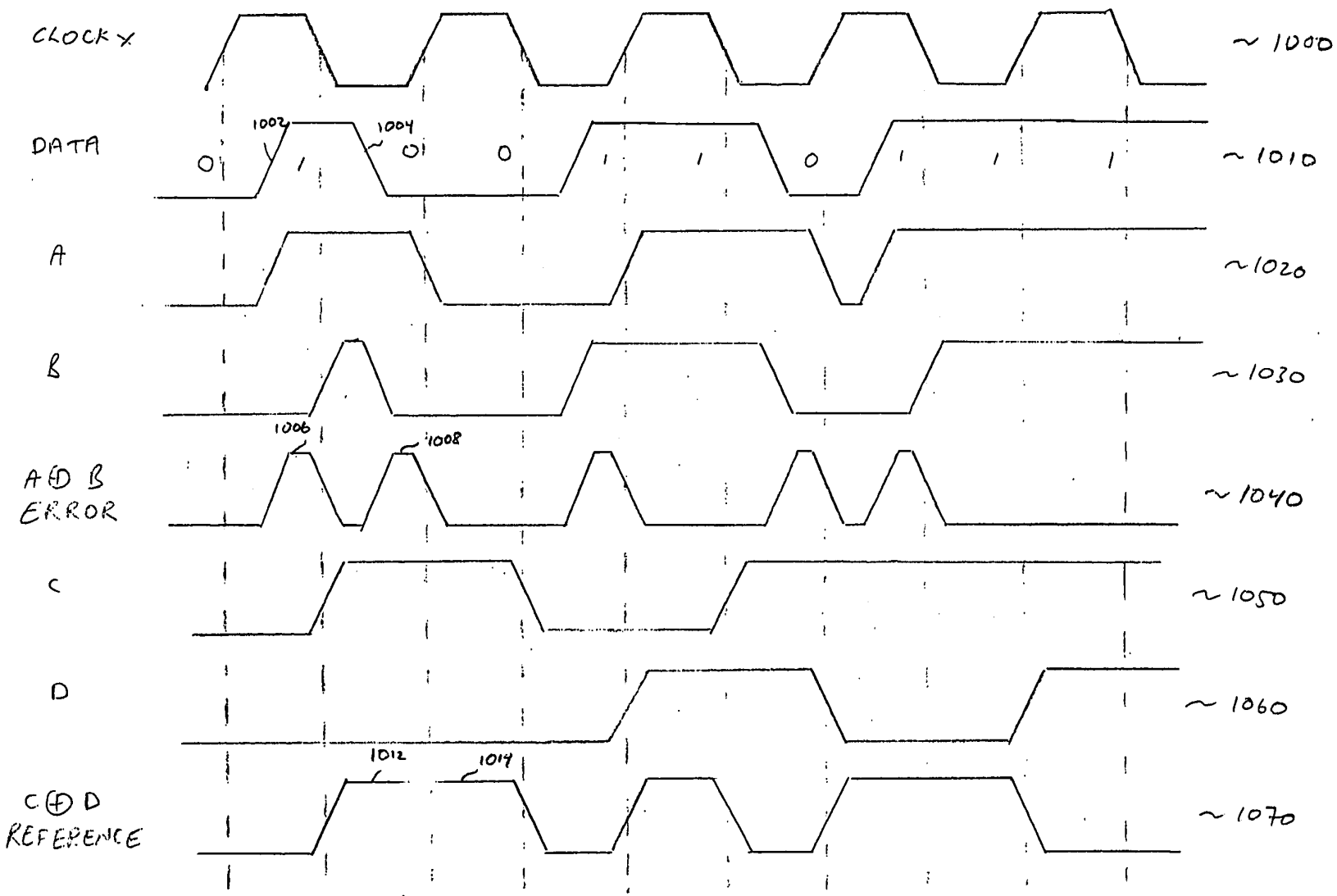


Figure 10

TOETED" 28926260

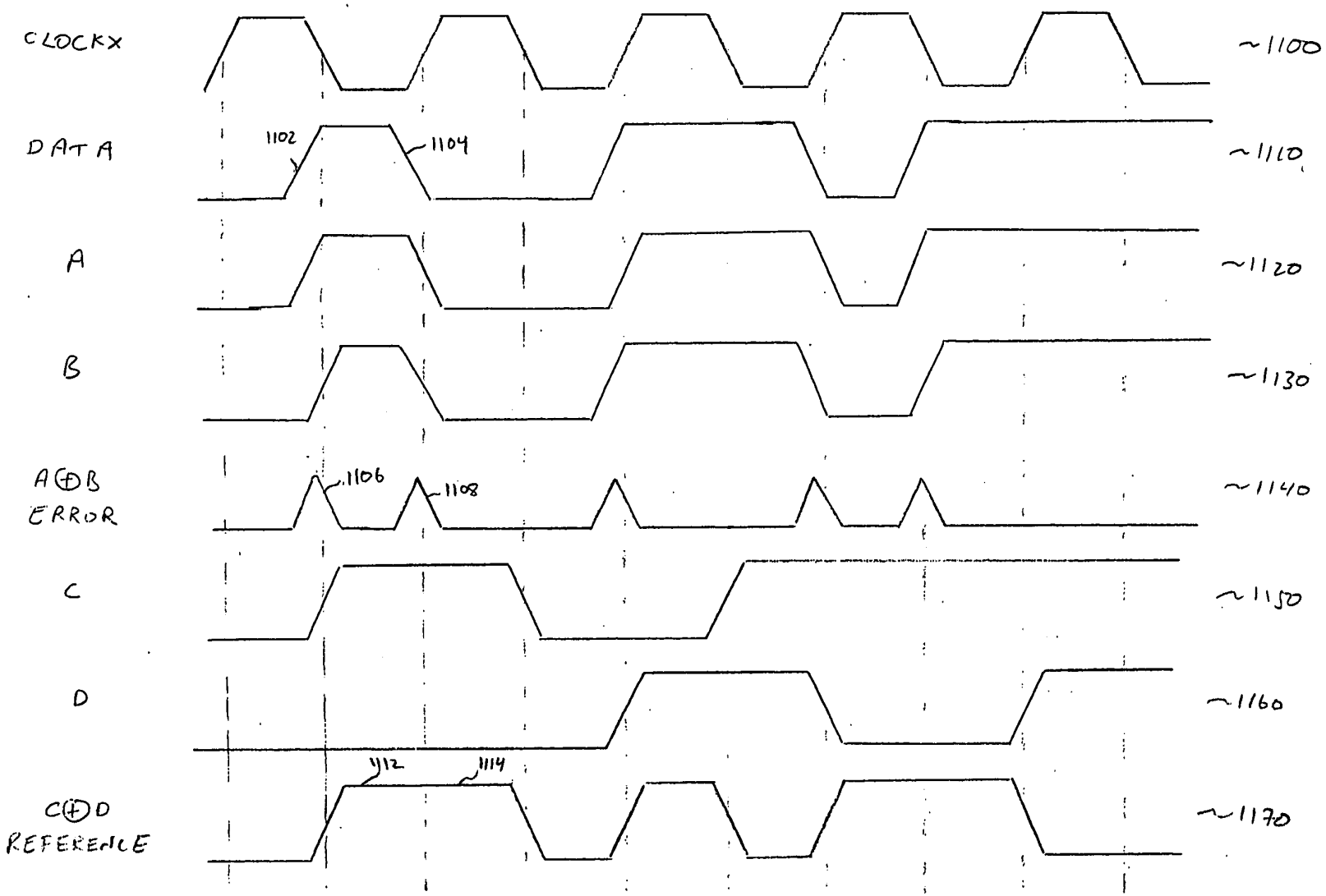
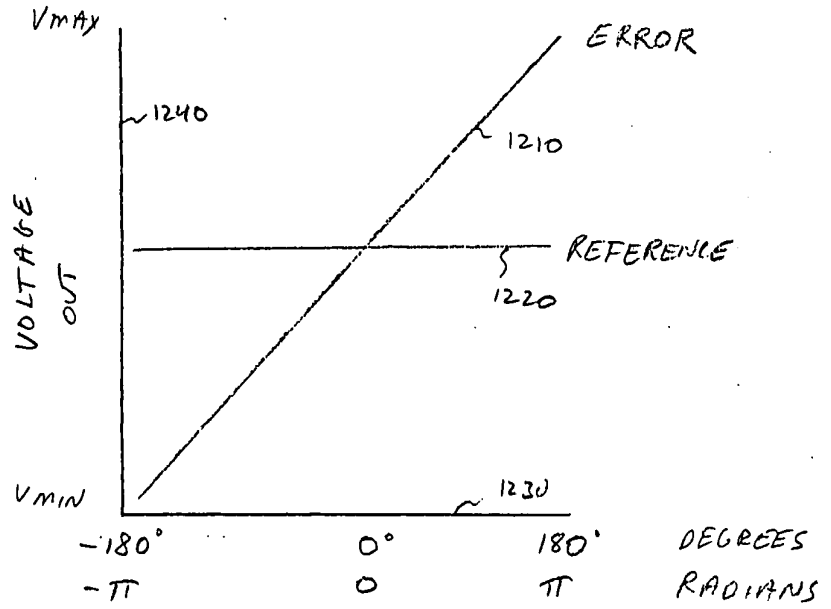


FIGURE 11

FOETED: 28926260

1200



PHASE ERROR

FIGURE 12

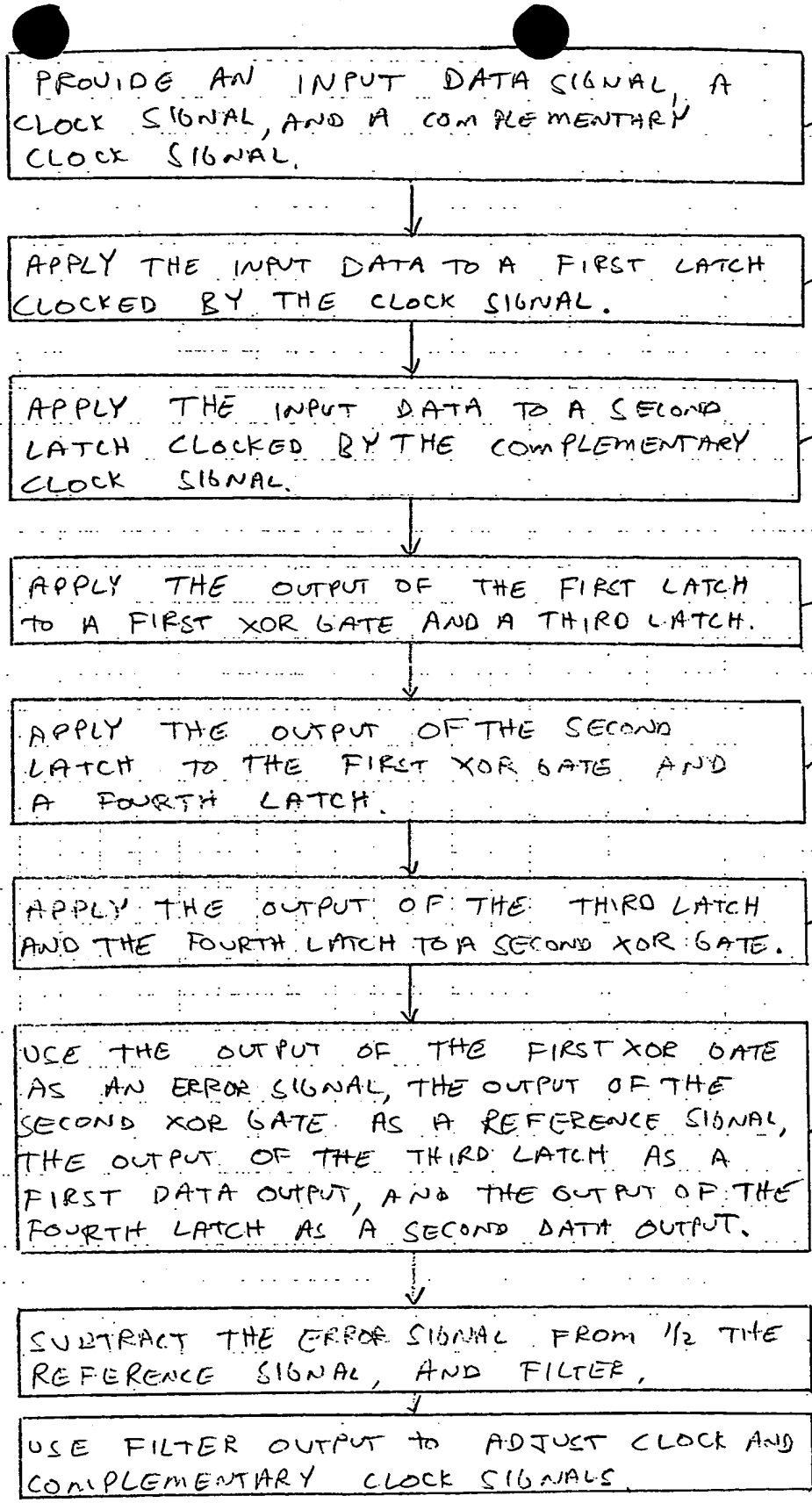

PROVIDE AN INPUT DATA SIGNAL, A CLOCK SIGNAL, AND A COMPLEMENTARY CLOCK SIGNAL.
1310
APPLY THE INPUT DATA TO A FIRST LATCH CLOCKED BY THE CLOCK SIGNAL.
1320
APPLY THE INPUT DATA TO A SECOND LATCH CLOCKED BY THE COMPLEMENTARY CLOCK SIGNAL.
1330
APPLY THE OUTPUT OF THE FIRST LATCH TO A FIRST XOR GATE AND A THIRD LATCH.
1340
APPLY THE OUTPUT OF THE SECOND LATCH TO THE FIRST XOR GATE AND A FOURTH LATCH.
1350
APPLY THE OUTPUT OF THE THIRD LATCH AND THE FOURTH LATCH TO A SECOND XOR GATE.
1360
USE THE OUTPUT OF THE FIRST XOR GATE AS AN ERROR SIGNAL, THE OUTPUT OF THE SECOND XOR GATE AS A REFERENCE SIGNAL, THE OUTPUT OF THE THIRD LATCH AS A FIRST DATA OUTPUT, AND THE OUTPUT OF THE FOURTH LATCH AS A SECOND DATA OUTPUT.
1370
SUBTRACT THE ERROR SIGNAL FROM 1/2 THE REFERENCE SIGNAL, AND FILTER,
1380
USE FILTER OUTPUT TO ADJUST CLOCK AND COMPLEMENTARY CLOCK SIGNALS.
1390

FIGURE 13